Space Weather Forecast

Issued on Tuesday, 15 November 2022 at 13:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate flares (Minor to Moderate radio blackouts) throughout. Slight chance of S1 (Minor) Radiation Storms and Strong flares (Strong radio blackouts).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity over the past 24 hours has been Moderate, but background X-ray flux is now up to Common-class levels with numerous mid-upper Common-class flares, and one Moderate flare from the largest region on the disc in the northwest. This large, complex region has shown strengthening of its intermediate spots, with increased magnetic complexity at times. The region poses the most significant risk for further flares at this time. The other large region to the south of the most active region has continued to slowly decay and appears simpler and smaller than at the start of the period. One further region in the northwest has shown some growth, with minor spot proliferation. The remaining region in the northeast appears to have remained small and simple.

No significant Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind was indicative of waning coronal hole fast wind influences. Wind speeds were slightly elevated, varying, but on a declining trend between 410-440km/s. Total magnetic field strength has been weak throughout, with the important north-south component fluctuating weakly. Geomagnetic activity was Quiet (Kp 0-2) throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with a chance of isolated Moderate flares throughout. There is also a slight chance of isolated strong flares. The most likely source of flare activity is from the largest, most complex sunspot group in the far northwest.

Solar Wind / Geomagnetic Activity: No significant Earth-directed CMEs are expected during the period, though some minor CME effects are possible from a glancing blow on 18 Nov.
Solar winds are currently at slightly elevated levels due to waning coronal hole influences. Winds are expected to continue to slowly decline through Day 1 (15 Nov). There are two small coronal holes which may give some weak enhancement into Day 2 (16 Nov). Geomagnetic activity is expected to be predominantly Quiet to Unsettled through the period. There is a chance of isolated Active intervals if we encounter effects associated with the two coronal holes late on Day 1 or Day 2, or if we experience any weak CME related enhancements on Day 4 (18 Nov).

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Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is most likely to persist at background levels. However, there is a slight chance of an increase in solar radiation emanating from the two largest sunspot regions in the far northwest.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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